6,000–7,000 feet, September 3–6, 1915, by A. S. Hitchcock (Amer. Gr. Nat. Herb. no. 819).

This species has been referred to *Stipa scribneri* Vasey, but differs in having shorter, nearly equal glumes, which are prominently scabrous, shorter awns, and shorter, lobed lemmas, which are evenly hairy all over. In *S. scribneri* the glumes are unequal, the first about 10 mm., the second 15 mm. long, scaberulous, the awns are 17–20 mm., the lemmas are 7–9 mm. long, the lobes of which are less than 0.5 mm. long, and the hairs at the summit are 2 mm. long, conspicuously longer than those on the body.

Rocky hills at medium altitudes, southern Texas and New Mexico.

Texas: Chisos Mountains, *Moore & Steyermark* 3362; Guadalupe Mountains, *Moore & Steyermark* 3638; without locality, *Nealley.*

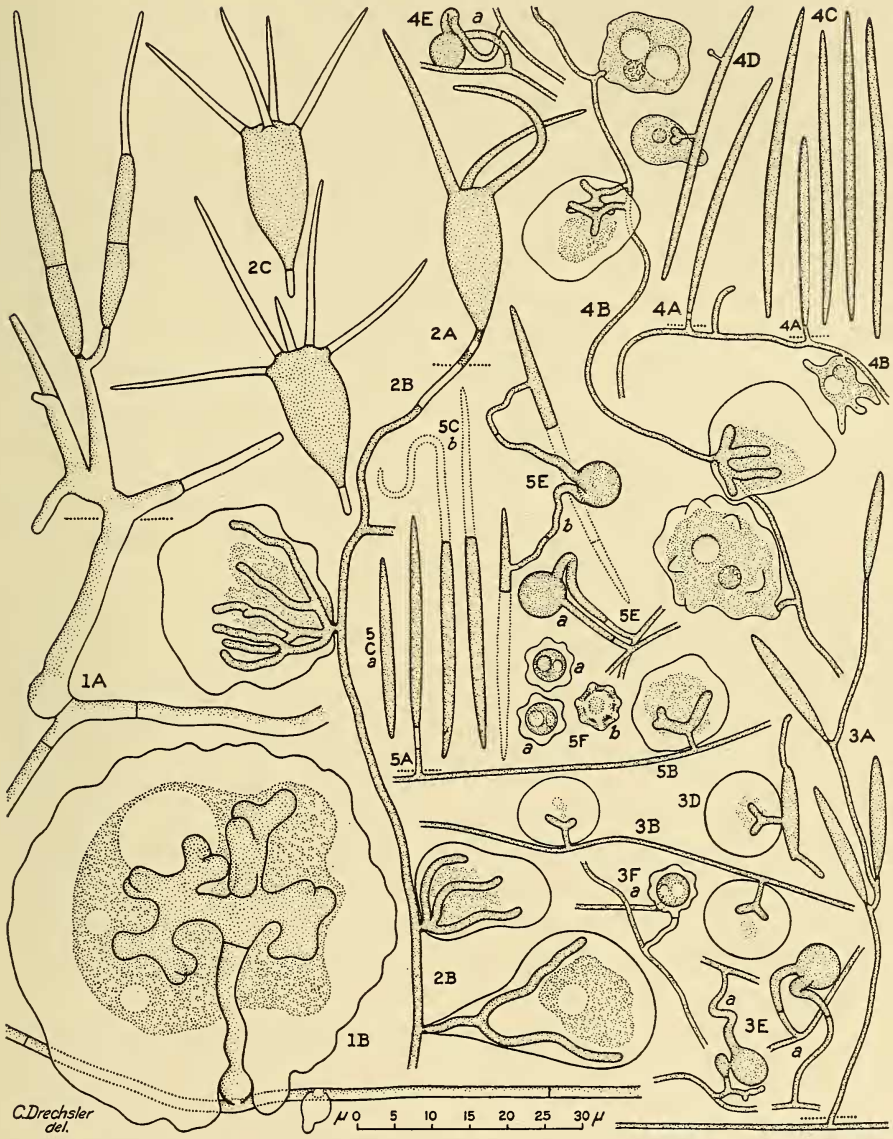
New Mexico: Guadalupe Mountains, *Amer. Gr. Nat. Herb.* no. 819; Filmore Canyon, Organ Mountains, *Hitchcock* 3773.

BOTANY.—*Morphological features of some fungi capturing and killing amoebae.*[1] Charles Drechsler, Bureau of Plant Industry.

Amoebae developing in agar plate cultures started from plantings of diseased rootlets and other decaying plant materials were found to be captured and killed often in large numbers by various fungi.[2] A protozoan of large size identified provisionally as *Amoeba verrucosa* was preyed upon by a fungus distinguished by rather short, somewhat tapering, sparingly branched, noticeably but not markedly differentiated conidiophores bearing elongated 2-celled conidia, the latter individually having an empty third cell present as an apical appendage nearly equal in length to the two living cells taken together (Fig. 1, A). Capture was effected by the animal being held fast on short, rather globose, ultimately somewhat yellowish adhesive protuberances borne laterally on prostrate superficial hyphae. At the place of contact the animal's pellicle was soon perforated and a somewhat expanding hyphal outgrowth thrust toward the center of the host where through close successive dichotomous branching in three planes (Fig. 1, B) a fairly intricate complex of swollen elements was produced, which though at first continuous, later with the exhaustion of the protoplasm of the host, became closely septate. A smaller amoeboid organism was captured through adhesion to the prostrate, narrow, non-septate, superficial hyphae of a fungus bearing on short undifferentiated aerial hyphal branches or on short, undifferentiated,

[1] Received March 10, 1933.

[2] Detailed descriptions and taxonomic discussion of these forms are reserved for a more comprehensive account of predacious fungi which is in preparation.



Figs. 1–5.—Various amoeba-capturing fungi, each numeral denoting a separate species, all drawn with the aid of the camera lucida at the same magnification; ×1000. A, Conidiophore or conidiophorous hypha, the proximal beginning of the aerial part being indicated by a heavily dotted line. B, Captured amoebae adhering to prostrate filament, mostly with development of fungus within. C, Detached conidia. D, Conidium with germ tube directly invading animal host. E, Sexual apparatus showing union of oogonium and antheridium, these being borne on (*a*) mycelial branches or on (*b*) germ tubes. F, Mature oospores with enveloping oogonial walls, shown (*a*) in optical section and (*b*) in surface aspect.

aerial prolongations of prostrate hyphae (Fig. 2, A) 1-celled inversely flask-shaped spores, that are provided at maturity with a short, empty, basal stipe and 2 to 6, usually 3 to 5, divergent, gradually tapering, empty, subapical appendages, of lengths approximately equal to the length of the living cell (Fig. 2, C.) A yellow deposit of adhesive material marked each place of contact, through the center of which the fungus proliferated a narrow outgrowth that perforated the animal's pellicle to give rise within to an open bushlike ramifying system of subequal hyphal elements, the branching being of moderate extent and occurring mostly at or near the point of entry (Fig. 2, B). Amoeboid animals of smaller dimensions were captured through similar adhesion on the very delicate, superficial, non-septate, prostrate hyphae of a fungus bearing fusoid, non-septate conidia on erect, otherwise undifferentiated, aerial hyphae either singly or in some number following repeated continued growth of the filament (Fig. 3, A). Frequently here the mycelial development within the host is limited to a narrow stalk terminating dichotomously in two short but slightly expanded divergent arms (Fig. 3, B). Slightly greater but very similar mycelial development occurs within the somewhat larger amoeboid animals captured through adhesion (Fig. 4, B) on the very delicate, prostrate, superficial, non-septate hyphae of a fungus bearing on usually very short, erect, undifferentiated branches (Fig. 4, A) aerial, acicular conidia without appendages (Fig. 4, C). In a fungus morphologically closely similar to the last, but the originally acicular conidium (Fig. 5, C, *a*) of which on maturation becomes evacuated in the distal portion so as to bear an empty apical appendage often about equal in length to the living cell (Fig. 5, C, *b*), similar development of mycelium within similarly small amoeboid organisms (Fig. 5, B) is associated with further parallelism in absence of septation in the mycelium, in mode of capture and in sporulating habit (Fig. 5, A).

In addition to their decidedly caducous, colorless conidia the three fungi last referred to each produce on or in the substratum a yellow oospore, the polygonal or sigillate outer profile of which (Figs. 3, F, *a*; 5, F, *a*) is associated with sculptured ridged external thickenings of the oospore wall (Fig. 5, F, *b*). This oospore in all three species is produced through the fertilization of a terminal globose oogonium by a slightly expanded terminal antheridium borne on a branch arising from a neighboring hypha (Figs. 3, E, *a*; 4, E, *a*; 5 E, *a*). Not infrequently the germ tube from a conidium gives rise rather directly to a sex organ (Fig. 5, E, *b*), just as in other instances it very directly penetrates a host animal (Figs. 3, D; 4, D).